GEORGE GRIFFITH.

THE news of the sudden death of Mr. George Griffith, Assistant General Secretary to the British Association, came as a shock to all who were acquainted with his vigorous personality. On the afternoon of May 7 he left the office of the British Association apparently in his usual health, and took his place in the train from Baker Street Station for Harrow. Scarcely had the train started when he was seized with an attack which ended fatally in a few minutes.

Griffith's career was divided into three periods—his Oxford life, his long tenure of an assistant mastership at Harrow School, and the last twelve years of his life occupied with his duties as assistant general secretary of the British Association.

His career at Jesus College, Oxford, was a brilliant one. After taking honours both in classical and mathematical moderations, his name appears, alone, in the first class in the final school of natural science in 1856. For the next eleven years he resided at Oxford, where he married a daughter of Mr. A. H. D. Acland Troyte. Toward the latter end of this period he was appointed deputy for the professor of natural philosophy, from which position he was summoned in 1867 by Dr. Butler to inaugurate the teaching of natural science at Harrow.

The task before the new-comer was by no means easy. The teaching of science, which had been forced on the attention of reluctant governing bodies by the recommendations of the Endowed Schools Commission, was regarded with scant favour by the majority of schoolmasters, while among the boys it was frankly disliked. At Harrow there was at that time neither laboratory nor special class-room; Griffith was allowed the use of a room when it was not being used by another master, but all apparatus had to be cleared away after each lecture before the entrance of the legitimate tenant. This state of things continued until about 1874, when properly equipped laboratories were erected. For twenty-six years (1867–93) Griffith taught at Harrow, in his earlier years taking physics, chemistry, geology and biology, according to the demand; latterly he confined himself almost exclusively to physics. In 1871 he entered into possession of a "Small House" (a boarding-house for nine boys), which he held until, in 1887, he succeeded Mr. Holmes as the master of "Druries," a larger and more responsible charge. In 1893 he retired from his mastership, having already been appointed (in 1890) assistant general secretary to the British Association for the second time.

His active connection with the British Association began at a much earlier date. We find him acting as local secretary at the Oxford meeting of 1860, memorable for the Huxley-Wilberforce battle over Darwin's works, while in 1862 he entered on his first term of office as assistant general secretary. Having resigned in 1878, he was prevailed upon to take charge of the work for the year 1881, during a temporary vacancy. In 1890 he was re-appointed, and carried on the work of his office with full vigour until an hour before his death.

During his latter years he threw himself with characteristic energy into the Royal Society's scheme for an international catalogue of scientific literature, a task for which he was singularly well fitted by wide learning, both scientific and linguistic, his unfailing memory and his fastidious accuracy of thought and expression.

He was laid to rest, on May 13, in the old churchyard of Harrow-on-the-Hill, above the little town that had been his home for thirty-five years, and the old school into which he had been the first to introduce the systematic teaching of science. B. P. L.

NOTES.

M. T. Moureaux, who has for twenty years been connected with the magnetic work of the Parc Saint-Maur Observatory, has been appointed to succeed the late M. Renou as director of the Observatory.

Prof. T. C. Chamberlin, of Chicago, Dr. T. Thoroddsen, of Reykjavik (Iceland), and Prof. S. W. Williston, of the University of Kansas, have been elected foreign correspondents of the Geological Society.

The Prince of Wales has consented to become an honorary member of the Linnean Society. The following gentlemen have been elected foreign members of the Society:—MM. A. Giard, H. J. Hansen, C. S. Sargent, F. E. Schulze and J. Wiesner.

On Tuesday next, May 20, Prof. Karl Pearson will deliver the first of three lectures at the Royal Institution on "The Laws of Heredity, with Special Reference to Man." The Friday evening discourse on May 30 will be delivered by Mr. G. Marconi, on "Electric Space Telegraphy," and that on June 6 by Sir Benjamin Baker, on "The Nile Reservoirs and Dams.'

The new botanical laboratories, presented to University College, Liverpool, by Mr. W. P. Hartley, were opened by Sir William Thiselton-Dyer, K.C.M.G., F.R.S., on Saturday last. The new Institute is an imposing building and the accommodation it affords will facilitate the advancement of the science of botany in Liverpool. The teaching of large classes of University students of botany is now not only possible, but easy; and in view of the probable early realisation of a University for Liverpool, this is a matter of some importance. Not only does Mr. Hartley's gift provide ample room for all probable increase in number of students, but the laboratories are equipped with the necessary appliances, both for elementary and advanced work. A special laboratory is set apart for investigations in plant physiology and another for anatomical research. The laboratories will thus not only become centres of teaching, but of work carried on with the view of contributing knowledge which will assist the progress of botanical science. We hope to give a description of the new Institute in a later issue.

Liverpool has often given evidence of its appreciation of the men of light and leading whose activities bring honour to the city. The return of Prof. Herdman from Ceylon, where he has recently spent several months in the investigation of the Pearl Oyster Fisheries, on behalf of the Government, provided Liverpool biologists and others with an opportunity of expressing their esteem for his work. A large company, including the Lord Mayor and Lady Mayoress, assembled at a complimentary dinner given to Prof. and Mrs. Herdman last week under the auspices of the Liverpool Biological Society. In responding to the toast proposed by Sir William M. Banks, Prof. Herdman was prevented from speaking on the principal object of the expedition, namely, his work on the pearl oyster, because the Government report had not been presented, but he gave an interesting account of other sections of his work and of visits to places of interest in and about Ceylon.

The annual conversazione of the Society of Arts will be held on June 24 at the Royal Botanic Gardens, Regent's Park.

A meeting of delegates representing a number of natural history and photographic societies was held at Croydon on Friday, May 9, Mr. W. W. Whitaker, F.R.S., being in the chair, to consider and set in motion a photographic survey of Surrey. It was resolved that a society be formed to be called "The Photographic Survey of Surrey," and that its object be to preserve a record in permanent photographs of buildings of interest, antiquities, scenery, geology, natural history, anthropology, and of portraits of notable persons, representations of passing events of local or historical importance, and of old records, rare books, prints, maps, so as to give a comprehensive survey of what is valuable and representative in the county of Surrey.

IN the death of Mr. John Clavell Mansel-Pleydell, of Whatcombe, near Blandford, Dorsetshire loses a man of wide influence and learning, a naturalist of the old school, distinguished for his labours on the botany, zoology and geology of his native county, and one who as magistrate and councillor had rendered great local services. He was born in 1817, educated at St. John's College, Cambridge, and succeeded to the family estates on the death of his father in 1863. He was a fellow of the Linnean and Geological societies, and one of the founders of the Dorset Natural History and Antiquarian Field Club, to the *Proceedings* of which he contributed many articles. He was author also of separate works on the flora, the mollusca and the birds of Dorsetshire. He died on May 3, 1902, aged eighty-four.

MR. J. MACFARLANE, honorary secretary of the Asiatic Society of Bengal, informs us that Sir Frank Athelstane Swettenham, K.C.M.G., the Governor of the Straits Settlements, has made the Society a grant of 2800 dollars, or Rs. 8750, for the purpose of completing the publication of the "Materials for a Flora of the Malayan Peninsula," by Sir George King, K.C.I.E., formerly superintendent of the Botanic Garden near Calcutta. The series of papers bearing this title is really a monograph, modelled on the lines of Hooker's well-known "Flora of India," of the flowering plants of the Malay Peninsula and the adjacent smaller islands, and it is as useful to the student as it is to the systematic botanist. The series was commenced in the *Journal of the Asiatic Society* for 1899, and up to last year nearly 1400 pages, including fifty-two natural orders, or rather more than half the work, had been published. One order, Leguminosæ, has been contributed by Major Prain, and Dr. O. Stapf, of Kew, has collaborated in the preparation of the suborder Melastomeæ. The Society's financial position would, however, scarcely permit the publication of the Malayan flora without support. At this juncture the Government of the Straits Settlements, which was naturally interested in the completion of the work, held out the prospects of financial aid being afforded, and has now sanctioned the liberal donation of Rs. 8750. This assistance places the Society in a position to complete without delay the publication of Sir George King's important contribution to the advancement of botanical research.

DURING a trial of M. Severo's air-ship at Vaugirard on Monday, an explosion occurred, causing the total destruction of the balloon and the death of M. Severo and his assistant, who were thrown to the ground from a height of more than one thousand feet. It is not known whether the accident was caused by an escape from the motors setting fire to the hydrogen in the balloon, or whether part of the machinery became heated and ignited the envelope, but the former appears to be the more probable cause of the calamity. The balloon shot up suddenly when it was released, and the expansion which must have occurred on account of the diminished pressure seems to have caused an escape of gas, which becoming ignited, resulted in the explosion. As the petroleum motor was little more than a metre from the envelope of the balloon, there was great danger that an accident of this kind would occur. In M. Santos Dumont's airship the motor was sixteen or eighteen metres from the balloon and far to the rear, so that the possible chance of gas ignition was much less. M. Severo designed his balloon with the object of avoiding the danger of pitching to which M. Santos Dumont's machine was liable. This feature must necessarily exist in the greatest degree in a machine in which the screw propellers are so placed that their resultant thrust has a considerable moment about the centre of the balloon. If the thrust acts nearly along the axis of the balloon and the car of the balloon is as close up to the balloon as possible, the pitching may be expected to be small. This was the essential feature of the Severo airship. The propulsion was effected by two screws attached to the balloon itself, and placed at either end of an axis that bisected the balloon longitudinally from end to end, while the car was drawn up close to the balloon. Another feature was the method of securing rigidity by means of a light rod running through the balloon from end to end and preventing it from crumpling in even if it should become somewhat deflated.

IN a letter to the *Times*, Earl Grey has directed attention to the important influence which the United States Fish Commission claim to have exerted upon the fish supply of their western coasts by means of the fish-hatching operations carried out by the Commission. The new illustration cited by the acting commissioner in his letter to Earl Grey has reference to salmon. It is stated that, of one lot of 5000 fingerlings released at the Clackamas (Oregon) hatchery in 1896, after having the adipose dorsal fin removed with a razor, 375 fish, averaging 27·7 lb., were captured in 1898 in the Columbia River basin and five in the Sacramento River (California); in the following year between forty and fifty others were taken, and in 1900 a number of others were reported, the fish caught in 1899 averaging 10 lb. heavier than those in 1898. It appears that not less than 450 marked fish, with an aggregate minimum weight of 10,000 lb., were secured in the second, third and fourth years following their release. "The foregoing figures mean that for every 1000 fingerling salmon liberated by this Commission on the Columbia River, 2000 lb. of adult fish were caught for market two to four years later. Reducing this to a financial basis, it appears that the cost of producing and planting young salmon is under 1 dollar per 1000 (including compensation of permanent employés), while the minimum value of the fish caught for market is 5 c. per pound, or 100 dollars for the 2000 lb. actually taken." The acting commissioner adds that it is the intention "to verify these results by additional and more conclusive marking experiments, which are already under way," and concludes his letter with a reference to the Commission's well-known success in introducing the Atlantic shad and striped bass into the waters of their west coast, where these fish now yield profitable fisheries. Everyone recognises the zeal and enterprise which the Americans have shown in the matter of fish-culture, as well as the success of their acclimatisation experiments cited above; and there will be general satisfaction, even among the Commission's critics, if they should ultimately be in a position to prove the commercial utility of their extensive salmon-hatching operations. The moral, however, which Earl Grey deduces for the behoof of our Fisheries Department, *i.e.* to go and do likewise, is more questionable. There is scarcely any need to introduce good fish into any of our British waters, and there are many who think that the salmon has already monopolised too much of the attention of our administrative authorities. On the other hand, a Fish Commission for Great Britain, on which science and practice were fitly represented, and which was provided with adequate means both for investigations and practical experiments, would fulfil a serious deficiency in our industrial organisation.

IN a small pamphlet of 21 pages which we have received, Father J. Fényi, S.J., describes a most ingenious apparatus for registering thunderstorms. The instrument seems to be due chiefly to the ingenuity of Father Johann Schreiber, S.J., an assistant a the Haynald Observatory in Kalocsa, who constructed it. The apparatus consists mainly of three portions; the first consists of a horizontal magnetic needle mounted on a vertical support between a small and sensitive coil of wire, the needle and its stop being connected with a battery, a bell and a registering apparatus, the needle when in contact with its stop completing the circuit. The registering apparatus is a small electromagnet which actuates a pen in contact with a disc, and the latter is connected with a clock and moves with regular velocity. The third and very important portion of the arrangement is the coherer, which is composed of two delicately suspended needles nearly in contact; these are connected in a circuit, which includes the coil in which the horizontal needle is placed, a cell, and the long intercepting wire, corresponding to the tall post with wire of the Marconi telegraph system. The apparatus works in the following manner. A distant flash of lightning starts a wave-impulse, and this is led to the coherer by the intercepting wire; the needles move and touch each other, thus completing the circuit, and allow a current to pass through the coil. This coil immediately causes the needle inside it to be deflected to the stop. The second circuit is thus completed, the needle on the registering apparatus marks a deflection on the disc, the bell is rung, and the vibration caused by the latter separates the needles of the coherer. According to the account here given, the instrument is very efficient and has been found to record storms as many as twenty miles away, while on another occasion the instrument during very fine weather was working "apparently rebelliously," but was really recording a great storm raging at Budapest (as shown by the time of occurrence and record at each place), a distance of 110 kilometres from the apparatus.

IN the *Scientific Transactions* of the Royal Dublin Society for April, Prof. F. T. Trouton discusses the remarkable experiment suggested by the late Prof. Fitzgerald for testing the relative motion of the earth and the æther. The idea of the experiment is that a charged electrical condenser, when moving through the æther with its plates edgeways to the direction of motion, possesses a magnetic field between the plates in consequence of its motion in accordance with the generally held view that a moving charge is equal to an electric current. As Prof. Trouton points out in the second part, the experimental realisation of the results anticipated opens up the possibility of utilising the earth's energy of motion through space, but it appears, so far as the observations go, that the effects sought are masked by some countervailing phenomena. In examining the paper at the present time, the recent discussions of Cremieu, Righi and other physicists on the question whether moving charges do actually generate a magnetic field, and allied points in the theory of electromagnetism, must not be overlooked.

WE have received a copy of a paper, by Mr. R. S. Hutton, on the fusion of quartz in the electric furnace. Mr. Hutton found that quartz can be readily fused in a Moissan arc furnace taking 300 amperes at 50 volts, and if air is supplied during the process reduction can be prevented. A modified form of furnace was built with a trough cut at right angles to the carbons, so that a carbon mould filled with broken-up quartz can be pushed under the arc. For making tubes, a carbon core is used, which is easily withdrawn afterwards, as it does not stick to the quartz. The tubes thus prepared are not quite free from bubbles, but can be improved in appearance by reheating under the arc, and, being thick-walled, can be used for drawing down and blowing. Mr. Hutton expresses the hope that this process may be extended by those having large supplies of power at their disposal, and may prove cheaper and more easily worked than the present method of fusion in the oxyhydrogen flame. Fused quartz apparatus might then be easily available, and its valuable properties would ensure its use for many purposes. Chief among these may be noted its low coefficient of expansion, its high melting point, and its power of withstanding sudden changes of temperature without cracking.

THE last number of the *Journal* of the Russian Physical and Chemical Society (vol. xxxiv. 2) contains a paper by Prof. Bohuslav Brauner on the position of the rare earths in Mendeléeff's periodical system of elements, which led to a very interesting discussion when it was read at the last Congress of Russian Naturalists. After having mentioned his experimental and theoretical work concerning the elements lanthanum, cerium, praseodymium, neodymium, thorium, &c., the author discussed the position of these elements in the periodic system, and the four different ways in which it may be attempted to place them in it. With Mr. Steele, of Melbourne, he comes to the conclusion that this group of elements represents a sort of node in the periodic system, between cerium and an unknown element which has the atomic weight of 180. This inter-periodic group is a continuation of the eighth series, which ends with the platinum elements; gold appears in such case as the first member of the ninth series, and not of the eleventh. In the twelfth series the first members are, probably, radium, thorium and uranium. This addition seems, in Mendeléeff's opinion, to deserve serious attention.

IN the latest *Bollettino* of the Italian Seismological Society, Dr. Cancani reconsiders the periodicity of the great earthquakes which have visited the coasts of the Marches and Romagna. By the discovery of some missing records, he has been able to fill up two gaps in the series, which now extends from 268 B.C. to 1874 A.D. The intervals between successive great earthquakes vary from 93 to 114½ years, the average interval being 101·9 years.

SOON after the Riviera earthquake of February 23, 1887, the geodynamic section of the Central Meteorological Office of Rome commenced the systematic record of all Italian earthquakes. During the first three or four years, the new section was getting into working order, but from 1891 onwards it attained that uniformity and regularity which now characterise it. The results of the first ten-year period (1891–1900) are summarised by Dr. A. Cancani in a paper published in the last *Bollettino* (vol. vii. No. 6) of the Italian Seismological Society. Taking into account only those shocks that were perceptible without instrumental aid, he finds that no less than 3361 earthquakes were observed in Italy during the ten years. The maximum monthly numbers occur in July and August, but this distribution is accidental and due to the very numerous shocks which followed the Monte Saraceno (Foggia) earthquake in July and August, 1893. During the last five years, the maximum numbers are found in January and March. The hourly distribution of earthquakes shows a minimum between 5 and 8 p.m. and a maximum in the first hour after midnight. Seismologists usually consider the midnight maximum as apparent and due to the condition of the observers, but Dr. Cancani remarks that the ratio of night earthquakes to day earthquakes is the same, namely 1·5, both for weak shocks (of intensities 2 to 4) and for strong ones (intensities 5 to 8). This is in direct contradiction to results previously obtained by de Montessus.

DR. HERGESELL, president of the International Aëronautical Committee, has communicated the following preliminary results of the balloon ascents which took place on the morning of February 6:—Strassburg, (1) temperature on ground – 0°·9 C., – 39°·7 at 8290 metres; (2) temperature at starting – 0°·1, – 6°·8 at 3600 metres. Berlin, temperature – 4°·4, and – 12°·9 at 3635 metres. Vienna, (1) temperature – 8°·6, and – 12°·0 at 3760 metres; (2) with Archduke Leopold Salvator and Archduchess Blanca in the car, temperature – 9°·0 at 3000 metres (temperature at starting not stated). Ascents were also made at Trappes (Paris) and Pavlovsk (St. Petersburg), but the results are not yet known. Mr. Rotch sent up a kite from Blue Hill Observatory, U.S. The lowest temperature, corresponding to the time of the European ascents, was −16°·0 at a height of 1242 metres. During the period in question there was an area of low barometric pressure over western Europe, which extended from Spain to Scandinavia, while over the eastern part of the continent there was an area of high pressure; the ascents from Vienna were made under the influence of the latter atmospheric conditions.

RESEARCHES carried on by Prof. F. E. Weiss on a Carboniferous plant-remain found at Halifax, and named *Xenophyton radiculosum* by Mr. Thomas Hick, show that the specimen may with little hesitation be regarded as the "root" of *Lepidophloios fuliginosus*—a view which supports the contention of the late Prof. W. C. Williamson that the plant was of stigmarian character. (*Manchester Memoirs*, vol. xlvi., 1902, No 9.)

THE *Annuaire* of the Royal Academy of Belgium for 1902 contains a biography, with portrait, of the late Baron de Selys Longchamps, who died at Liege in 1900. It appears that the family of Selys has been intimately connected with Liege since the seventeenth century. Full justice is done in the memoir to his work on the natural history of his own country, as well as to that on ornithology, ichthyology, and other branches of biology in general.

THE movements of gregarines are discussed by Mr. H. Crawley in the first part of the *Proceedings* of the Philadelphia Academy for 1902. The theory that these tiny organisms possess a kind of passive locomotion by means of the gelatinous threads they exude from the hinder part of the body is rejected—for one reason because such a mode of motion is unparalleled in the animal kingdom. Instead of this, the author believes that locomotion is effected by transverse muscular movements in the body, although the exact nature of the action and its results can only be surmised.

IN the *Proceedings* of the U.S. Museum (vol. xxiv.), Mr. Jordan, assisted in one case by Mr. M. Sindo and in another by Mr. J. O. Snyder, continues his valuable illustrated review of the fishes of Japan. Four parts are now before us, the first dealing with the surf-fishes (Embiotocidæ), the second with the angler-fishes, the third with the "trachinoids," and the fourth with the salmonoids. With regard to the lack of sharply defined specific or subspecific characters between the numerous forms of the latter, the authors are inclined to adopt the view that this is in part at least due to the modern origin of the group.

PROF. H. F. OSBORN, in the April number of the *American Naturalist*, urges the importance of "homoplasmy" as a law of latent or potential homology, taking for his text the independent origin of certain cusps in the cheek-teeth of the Primates which are clearly homologous. Assuming that all teeth started from the tritubercular type, we are forced to the conclusion that there is some principle in the constitution of these teeth which unifies up to a certain point the subsequent variation and evolution.

AN explanation of the survival of the brachiopod genus Lingula from Cambrian times is offered by Mr. N. Yatsu in *Annotationes Zoologicae Japonensis* (vol. iv. part ii.). A part of the Japanese coast where this brachiopod flourishes was a few seasons ago coated with a deposit of muddy sediment from a flooded brook. All the burrowing molluscs were immediately killed, but the Lingula were unharmed. As it is also known that Lingula will live in an aquarium after the water has become unfitted for other organisms, it is inferred that its survival is due to its power of withstanding unfavourable conditions. In the same journal, Mr. H. Kuwano describes a new Japanese Balanoglossus.

THE presidential address delivered by Dr. Erwin F. Smith before the Society for Plant Morphology and Physiology is published in full in a recent number of *Science*. Taking "Plant Pathology" as the subject of his discourse, comparisons are instituted between the conditions under which the pathologist worked twenty years ago and the improved modern-day methods. At that time pure cultures were almost unknown, and precise fixing and staining methods had not been devised. Then follows a considerable list of important researches from the time of De Bary down to the present day. Finally, looking forward, Dr. Smith suggests that the pathologist of the future will require to consult or, better still, train himself as a chemist and physicist. A preparation of eight years is considered to be none too long to fit the future pathologist for his life's work.

WE have received a copy of a syllabus of a special course in natural history for training college and King's students, issued, under the supervision of Prof. J. A. Thomson, by Marischal College, University of Aberdeen, for their summer session. The book, which is beautifully illustrated, appears in every way admirably adapted to the purpose for which it is intended. It commences with an examination of a series of types of British vertebrates, followed by a selection of invertebrates. Then comes a discussion of the principles of classification, with brief definitions of varieties, species, genera, &c. The structure of the cockroach is then exemplified, after which we have a brief table of the animal kingdom with appropriate illustrations. Another lesson deals with living animals, this being followed by a discussion on adaptation to surroundings and mode of life. The pupil is then introduced to the leading features in the structure of limbs, after which development claims his attention. Finally, there are illustrated studies of various types of common animals from four different points of view.

THE first number of the fortnightly *Agricultural News* (16 pages, one penny) was published by the Imperial Department of Agriculture for the West Indies on April 25, and has been very well received by the colonials. Its contents are of a most varied character, appealing to all classes of cultivators in the islands, dealing, not only with the staple industry, sugar, but also with bats, beetles, tarpon fishing, grape cultivation, market reports, notices of books, &c. It is proposed to make a special feature of reports on the work which is being carried on at chemical laboratories, botanic institutions, agricultural shows, &c., and of the promotion of agricultural education in the colleges and schools of the West Indies. In future the *West Indian Bulletin* will be the quarterly journal of the Department for scientific and technical readers, while the *Agricultural News* will be the publication for the masses and the classes. Although the Department has only been in existence a little more than three years, it is evidently already widely appreciated, for its publications have now an extensive circulation in all parts of the tropics, the income from the sales disclosing a steady increase.

DR. HERBERT J. WEBBER has published a complete account of his investigations on the germination of the pollen grain and the series of events leading to fertilisation in two species of Zamia (U.S. Department of Agriculture, Bureau of Plant Industry, *Bull.* 2, 1901). The paper is a valuable addition to our knowledge of a most important race of plants, and the author's treatment is critical as well as descriptive. He shows that the male prothallium consists at first of two (or possibly three) cells, of which the terminal one divides into a stalk and "central" cell (the latter = antheridial cell of other authors). From the central cell the two antherozoids are formed, and the entire mass is used in their formation. The blepharoplasts, which ultimately serve as the starting place for the coil of cilia in each antherozoid, are regarded as organs *sui generis;* and although their possible relation to centrosomes is also considered, the arguments against their identity with the latter are cogent. In fertilisation, the entire antherozoid enters the egg, and the cytoplasm and nuclei of the male and female cells respectively become fused. No centrosomes were observed during the cleavage of the fertilised egg during the formation of the embryo.

WE have received from the publishers (Messrs. Cassell, Ltd.) a copy of the first part of an illustrated quarto work on "European Butterflies and Moths," by Mr. W. F. Kirby, the well-known lepidopterist. The plates are excellent examples of modern colour-printing, and the work, so far as it has yet gone, may be described as an attractive subject attractively treated. Perhaps it would have been better if a little more prominence had been given in the text to the English names. The work is to be issued in fortnightly parts.

A VOLUME containing the physical papers of the late Prof. H. A. Rowland is now in preparation. It will be issued under the editorial direction of a committee appointed for that purpose, consisting of President Remsen, Prof. Welch and Prof. Ames. The book will contain Prof. Rowland's articles and memoirs on physical subjects, together with his popular writings and addresses, numbering sixty in all. It will occupy between six and seven hundred pages, and will be published at the price of one guinea net per copy. Orders may be sent to Prof. Joseph S. Ames, secretary of the committee of publication, Johns Hopkins University, Baltimore, Maryland.

THE industry of chemical perfumes is one of recent development and is rapidly assuming an importance second only to the colour industry in the field of commercial organic chemistry. The current number of the *Moniteur Scientifique* contains an account by MM. Marc Tiffenau, R. Bernard and A. Gloess of the exhibits in this field at the Paris Exhibition of 1900, preceded by a short sketch of the general methods employed in the preparation of chemical perfumes. It is interesting to note that practically the whole of this branch of applied science is divided between two nations, France and Germany.

THE conclusion of Maxwell from the electromagnetic theory of light that the dielectric capacity should be equal to the square of the refractive index has led to a mass of experimental work not always in accord with the law. In the current number of the *Comptes rendus*, M. Edm. van Aubel collects the experimental data for these two constants for four classes of nitrogen compounds, amines, alkyl nitrates, fatty nitro-derivatives and nitriles, and shows that in all cases the dielectric constant diminishes as the molecular weight increases, whilst the refractive index increases, a result obviously incompatible with Maxwell's law.

THE additions to the Zoological Society's Gardens during the past week include two Lesser Kestrels (*Tinnunculus cenchris*), a Short-eared Owl (*Asio brachyotus*) captured in the Red Sea, presented by Capt. E. W. Burnett; a Red-footed Falcon (*Tinnunculus vespertinus*), South European, presented by Miss E. Leeke; a Virginian Eagle Owl (*Bubo virginianus*) from the West Indies, presented by Mr. B. C. Storey; a Common Mynah (*Acridotheres tristis*) from India, presented by Mr. F. G. Miéville; two Syrian Bears (*Ursus syriacus*) from Western Asia, twenty-two Moorish Toads (*Bufo mauritanica*) from North-west Africa, five Amphiumas (*Amphiuma means*), ten Punctated Newts (*Amblystoma punctatum*) from North America, an Upland Goose (*Chloephaga magellanica*) from the Falkland Islands, received in exchange; a Japanese Deer (*Cervus sika*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

NEW VARIABLE STARS.—The following variable stars have been detected on plates taken with the astrographic telescope at Greenwich Observatory:—

Star.	R.A.			Decl.		Variation.	
	h.	m.	s.	°	′	m.	m.
6. 1902. Draconis ...	18	5	9 ...	+65	56·9 ...	9·0 –	<14
7. 1902. Draconis ...	18	6	54 ...	+66	8·9 ...	9·5 –	14
8. 1902. Camelopardalis	5	49	22 ...	+74	30·8 ...	8·9 –	<14

ELEMENTS OF COMET 1902 *a* (BROOKS).—The following elements computed for this comet are given in *Astronomische Nachrichten*, Bd. 158, No. 3790:—

$$T = 1902 \text{ May } 7{\cdot}159, \text{ Berlin M.T.}$$

$$\left.\begin{array}{r} \omega = 228^\circ\ 22'{\cdot}7 \\ \Omega = 52\ \ 15{\cdot}4 \\ i = 66\ \ 30{\cdot}4 \end{array}\right\} 1902{\cdot}0.$$

$$\log q = 9{\cdot}65436.$$

COLABA OBSERVATORY.—The Report of the Director of the Government Observatory at Colaba, Bombay, has been issued, and contains the results of magnetic and meteorological observations made during the year 1901.

The magnetic observations have been on regular record since 1842, but there is now reason to believe that disturbances will occur from the proximity of the electric tramways in Bombay. It is hoped, however, that a new site will be granted early enough to permit of a fresh series of determinations running parallel with the present, so that the value of such a long continuous record may not be seriously affected.

ATOMS AND VALENCIES.

AN offprint has come to hand of a thoughtful essay by Mr. J. Fraser, of the Scottish Ordnance Survey, entitled "A Theoretical Representation leading to Suggestions bearing on the Ultimate Constitution of Matter and Ether," which appeared recently in *Proc.* Roy. Soc. Edin. xxiv., i., 1902, pp. 1–64. Under this guarded title the writer discourses, in a manner often stimulating and suggestive, on the bearing on the facts of chemistry and chemical physics of a notion he has formed of the constitution of the æther, and of matter which he considers as constructed out of that medium. He begins by quoting Sir J. Herschel's opinion that the æther is "an adamantine solid," far denser, in fact, than the densest metal. The other alternative, that of inertia or density insensibly minute, has been more commonly in evidence in recent times, especially since Lord Kelvin showed that it was adequate for the transmission of radiant energy across space. It is something to know that the more unfamiliar view, which has recently again been broached in illustration of the laws of general æther-theory, presented no intrinsic difficulty to the mind of so competent an authority as Herschel. Enormous density implies still more enormous elastic resistance, which Mr. Fraser ascribes in a way to a kinetic origin, like Kelvin's and FitzGerald's turbulent motion. How is an atom of matter to be represented? Briefly and bluntly, in the words of the writer, as "a veritable ethereal bubble"—walled in by a single layer of æther-particles, in very rapid rotation, the centrifugal force of which prevents the bubble from collapsing under the enormous ambient pressure. How is its permanence assured? Astronomical analogies are invoked in favour of its possibility; but the sceptical critic had better refrain from too close scrutiny in order to pass on to see whether any light on atomic behaviour is shed by a somewhat loose representation of this sort. After all, a hollow vortex-ring atom is a ring-shaped bubble kept open much in this way; and representations dynamically vaguer than this have turned out in chemical science to contain the germ of fruitful and far-reaching progress. A sort of Le Sage corpuscular theory of gravity is set forth with considerable freshness and some plausibility. But the most interesting sections relate to chemical suggestion, with regard to which the writer modestly confesses to little knowledge except what has been acquired with a view to the present attempt. It may be remarked on his behalf that knowledge of speculative scientific theory, when acquired with some constructive intention of this sort, even if it be visionary, is apt to be a much more real possession than when the aim is merely to become well-informed in a colourless way about the opinions that